Building Consistency

July 5, 2017

Agenda

- Welcome, Housekeeping & Customer Service
- Reminders -
  - Schedule for Building Consistency Meetings
    - Commercial – 1st Tuesday; Residential – 1st Wednesday
  - Monthly Deadline for Submission of Items
- Training Strategy & Opportunities
- Residential Consistency Items
- Training Session – ~~Sales Offices and Model Homes~~ *(postponed)*

2017 Bldg Consistency Mtgs

Commercial

- Aug 1
- Sep 5
- Oct 3
- Nov 7
- Dec 5 – Product Fair

Residential

- Aug 2
- Sep 6
- **Oct 11 – date change**
- Nov 1
- Dec 6 – Product Fair

Deadline for submission of building consistency items – 3rd Wed of each Month

Items can be submitted by email jeff.vernon@mecklenburgcountync.gov

or online: http://charmeck.org/mecklenburg/county/LUESA/CodeEnforcement/Tools/Forms/Pages/ConsisTopicSubmit.aspx

or by contacting any of the Building Consistency Team members

CE / ISO Strategy for FY 2018

- Yet to be determined for technical time
  - Commercial Building – 1st Tuesday
  - Residential Building – 1st Wednesday
  - Electrical – 2nd Wednesday
  - Plumbing – 4th Wednesday
  - Mechanical – Last Tuesday of the month
- Legal classes – dates have already been scheduled (Jan 11-12; 25-26; Feb 8-9; 22-23) and outlines will be submitted to the State for CE credit again.

Training Topics for Future Building consistency Meetings

- Aug 1 (C) – **Lateral Resistance and Design, Trina Agnello, PE**
- Aug 2 (R) – Sales Offices and Model Homes, Jeff Griffin
- Sep 5 (C) –
- Sep 6 (R) –
- Oct 3 (C) –
- Oct 11 (R) –
- Nov 1 (R) –
- Nov 7 (C) –
- Dec 5 & 6 – Product Fair

Building Code Qualification 2017

- July 21 – 23; Aug 5 & 6 – Level III
- Sep 22 – 24; Oct 7 & 8 – Level II
- Nov 17 – 19; Dec 1 – 3 – Level I
- Schedule for 2018 classes has been set.

Residential Items

July 5, 2017

Open Items

- **What is the proper way to post a permanent address?**
- **How are shims/plates secured at piers?**
- **New Simpson hold-down for sole plates**

Address Requirements

SECTION R319
SITE ADDRESS

R319.1 Address numbers. Buildings shall have *approved* address numbers, building numbers or *approved* building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of $^1/_2$ inch (12.7 mm). Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure.

..\Building Code Interpretations\Residential Site address.pdf

- Numbers placed on a fixed non-moveable portion of the structure
  - Not on operable doors
- Must contrast with background
  - Not on windows
- Arabic numbers only. No Roman numerals
- Minimum 4” high numbers with minimum stroke width of ½”
- Big enough to be seen from road or provide an additional set of numbers at the street
- In new housing developments, street signs must be up at final
- Temporary addresses are only allowed during construction phase

INFORMAL CODE INTERPRETATION

NC Department of Insurance
Office of the State Fire Marshal - Engineering Division
1202 Mail Service Center, Raleigh, NC 27699-1202
919-661-5880

Wood Girder Plates

Code: 2012 Residential Code
Section: R502.6

Date: July 3, 2012
Revised: March 28, 2014

Question:
Can wooden plates (not wedges) be used between wood girders and foundation piers?

Answer:
Yes. There is nothing in the code that prevents the use of wooden plates, but there is also nothing in the code that provides prescriptive design information for them either. The code does not restrict a wood girder from being out of level; so, we have to assume that plates to reduce that condition are a step in the right direction if the plates do not compromise the structural integrity of the pier/girder relationship.

The following guidelines will apply:

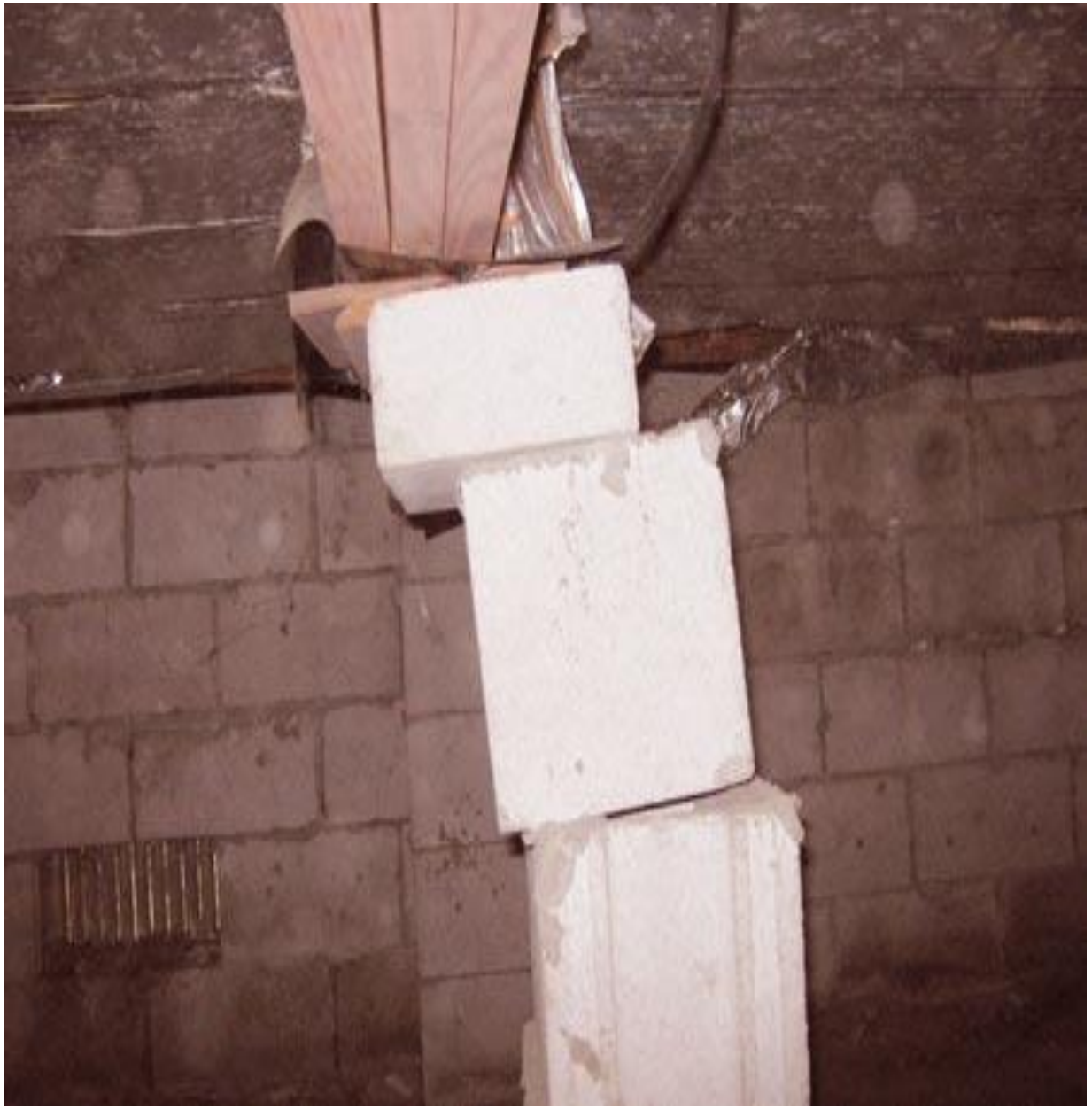
1. Plates would have to meet the requirement of Section R502.6 for bearing surface as well as applicable requirements for protection against decay in Section R317.
2. The minimum width of a plate must be the width of the girder that is being supported.
3. The minimum length of a plate must be the width of the pier on which it rests.
4. The maximum depth/thickness of a plate is restricted to less than 4 inches because of the available heights of standard masonry.
5. Multiple member plates (i.e. 2 or more pieces of wood stacked on top of each other) must have the members fastened together to form a single unit and the single unit plate must be fastened to the girder to prevent independent movement.
6. The plate material must be a minimum perpendicular to grain compressive strength equal to the wood girder material.
7. Horizontal forces are not resisted at the plate location.

For the purposes of this interpretation "wooden girder plate" is a flat member consisting of a single or multiple pieces of wood with relatively even thickness that is placed between the top of a pier and the bottom edge of a wood girder where it rests on the pier. This may also be referred to as a shim, but obviously cannot be of a wedge shape.

Keywords:
blocking, foundation

How are Plates / Shims Secured at Piers?

The State doesn't talk about shims but rather uses the word plates and requires them to be secured together and nailed to the girder to prevent movement. Please advise builders and don't automatically turn them down if you see one not nailed to the girder.



New Simpson Anchoring Device

URFP/FRFP Retrofit Foundation Plates

The URFP universal retrofit foundation plate is the new, improved version of the UFP, offering increased load while maintaining the same adjustability during installation. Ideal where there is minimum vertical clearance, the URFP provides a retrofit method to secure the mudsill to the foundation. This new design allows installation flexibility when the mudsill is offset or inset from the foundation edge. With its combination of longitudinal embossments, stiffening darts and scalloped slotted holes, the URFP allows for a one-for-one replacement of 1/2" or 5/8" mudsill anchors as well as fixity to both the SDS screws and required concrete anchorage.

The next generation FRFP flat retrofit foundation plate connects the mudsill to the foundation and provides lateral load resistance. This new design allows the Designer to maintain the same prescriptive requirements when filling the original three holes, or as an alternate, fill the newly added two optional triangle holes and utilize increased loads and greater allowable spacing.

Material

- URFP — 14 gauge; FRFP — 7 gauge

Finish

- Galvanized. May be ordered HDG; contact Simpson Strong-Tie. See Corrosion Information.

Installation

- Use all specified fasteners; see General Notes.
- Loads are based on test results using Simpson Strong-Tie® Strong-Drive® 1/4" x 3" SDS Heavy-Duty Connector screws, which are supplied with the URFP.
- For URFP, alternate lag screws will not achieve published loads.
- FRFP shall use a minimum Strong-Drive SDS Heavy-Duty Connector screw length of 2 1/2" plus the shim thickness. FRFP may be installed with 1/4" HDG lag bolts. Follow code requirements for predrilling.

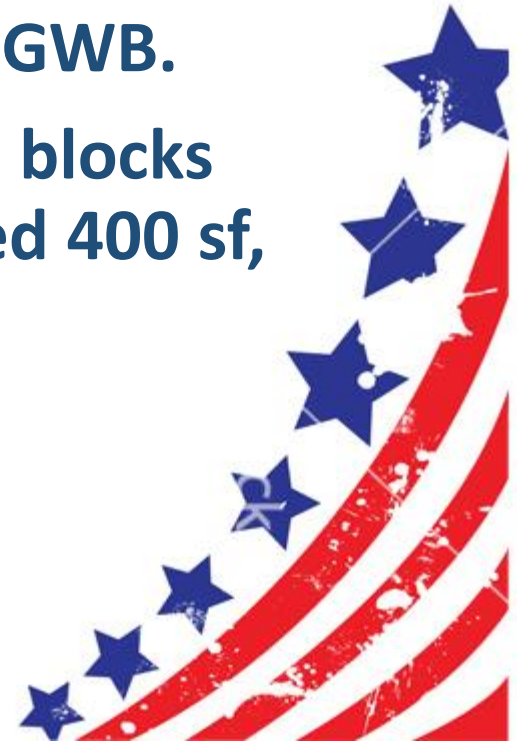
Related Links

- Wood Construction Connectors Technical and Installation Notes
- General Notes

Residential Code Consistency Items

- **What is the allowable amount of drilling and notching at top plates? What is the proper strapping when the top plate is cut, drilled or notched >50% of its depth?**
- **Do we require an additional inspection to check the WSP on 3 story townhomes where it is used for the shear walls? We don't currently have a specific inspection for screws when using GWB.**
- **When are permits required for Accessory buildings? When blocks are used to level an accessory building that does not exceed 400 sf, what is the maximum block height allowed?**

(continued)

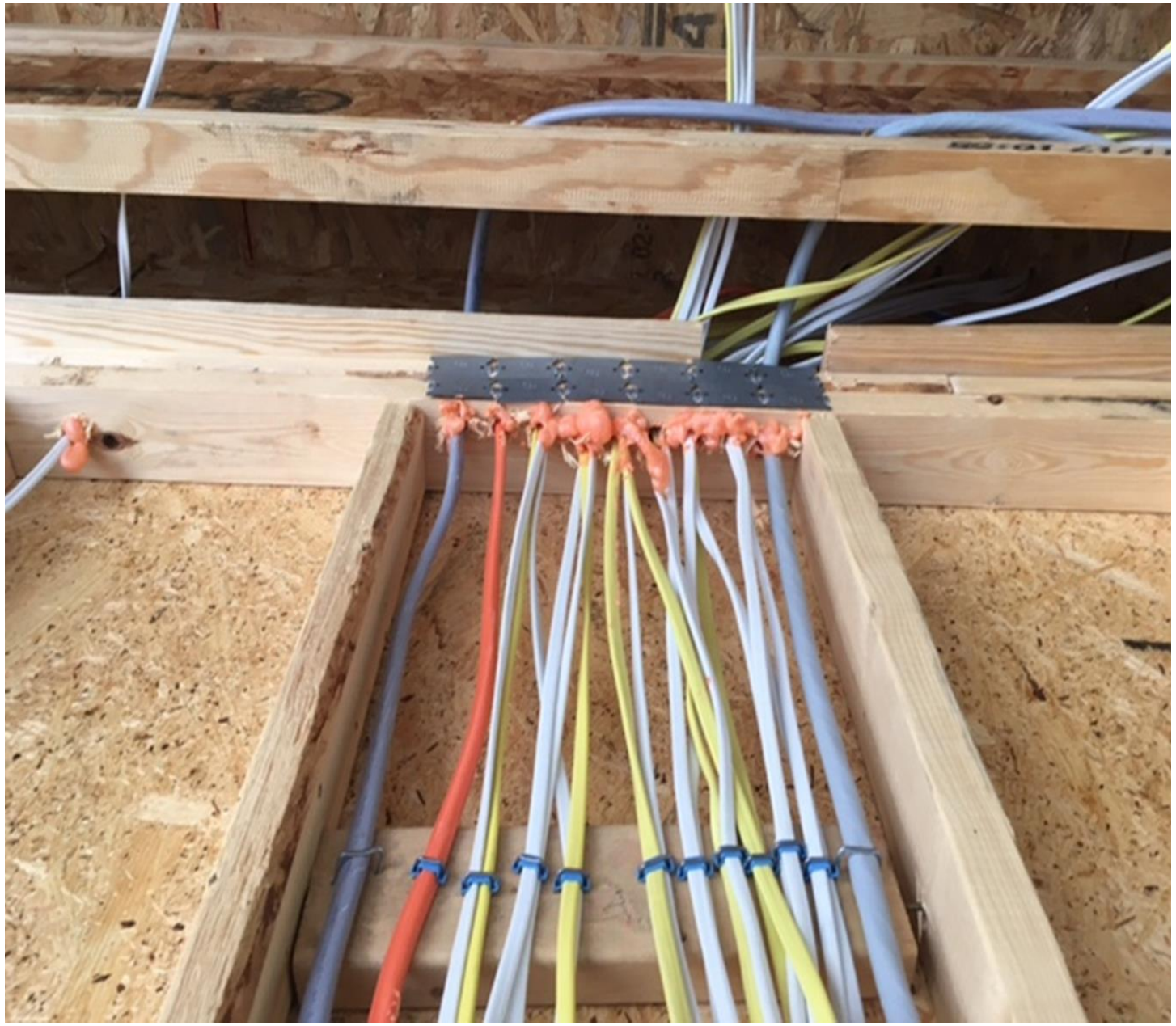


Residential Code Consistency Items

- **What is required for attic flooring? When are guardrails required in an attic? When should an attic be labeled “Not for Storage”?**
- **Is flashing required at masonry window sills?**
- **Is firestopping required in the wall adjacent to the stairs at the stair stringers?**
- **Where handrails pass by a tread nosing, must we maintain 1 ½” clearance between nosing and handrail?**
- **What are the code requirements, if any, for guardrails on walkways, stairs and upper level decks on piers?**

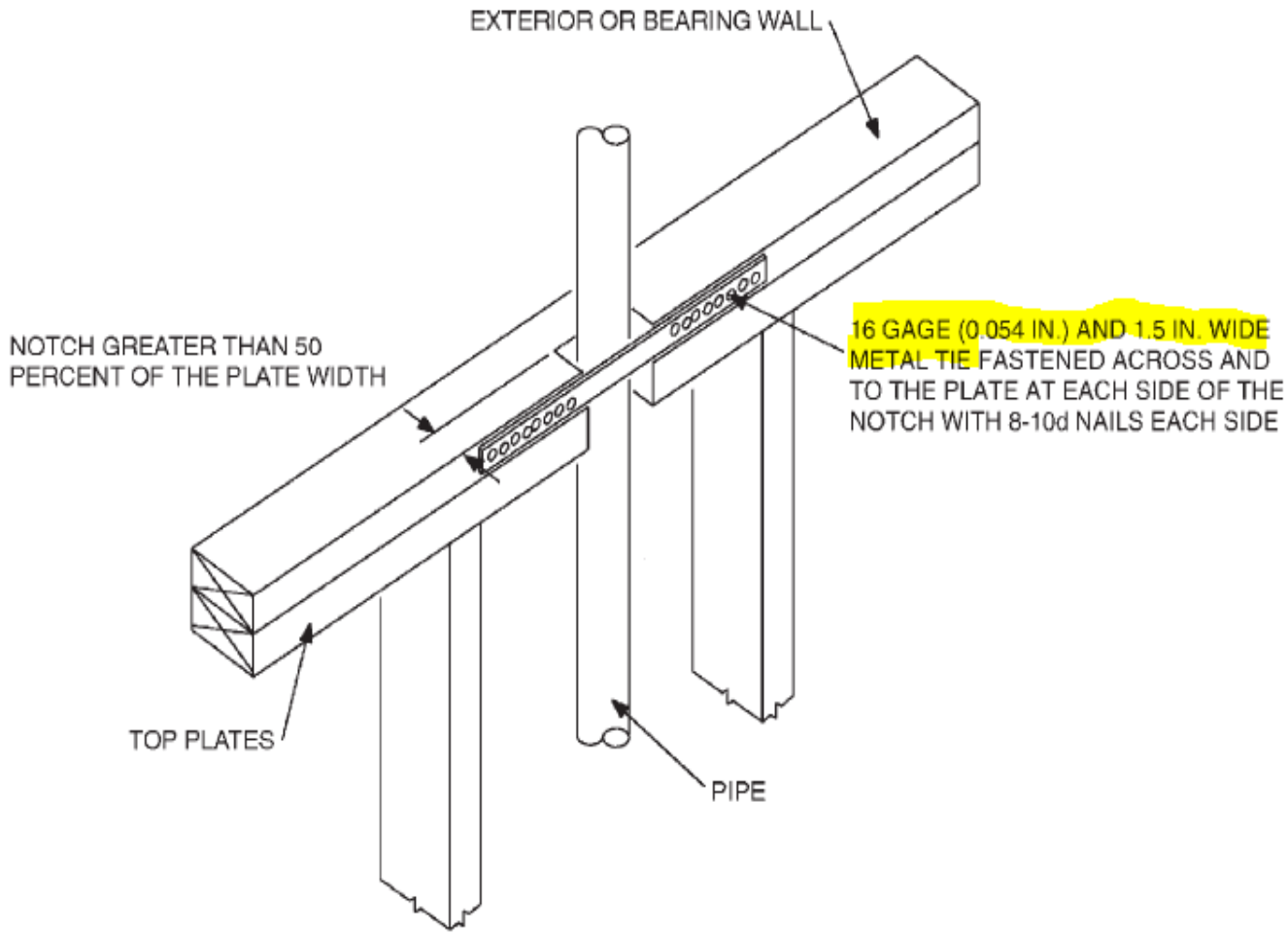
What is the allowable amount of drilling and notching at top plates?

What is the proper strapping when the top plate is cut, drilled or notched > 50% of its depth?



R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (16 ga) and $1^1/_2$ inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) having a minimum length of $1^1/_2$ inches (38 mm) at each side or equivalent. The metal tie must extend a minimum of 6 inches past the opening. See Figure R602.6.1.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.



For SI: 1 inch = 25.4 mm.

FIGURE R602.6.1
TOP PLATE FRAMING TO ACCOMMODATE PIPING

Do we require an additional inspection to check the WSP on 3 story TH's where it is used for the shear wall?

In comparison, we don't have a separate inspection for screws in GWB when using that method.

When are permits required for accessory buildings?

Accessory buildings with any dimension greater than 12 feet must meet the provisions of this code. Accessory buildings may be constructed without a masonry or concrete foundation, except in coastal high hazard or ocean hazard areas, provided all of the following conditions are met:

1. The building shall not exceed 400 sq. ft. or one story in height;
2. The building is supported on a wood foundation of a minimum 2x6 or 3x4 mud sill of approved wood in accordance with Section 323: and
3. The building is anchored to resist overturning and sliding by installing a minimum of one ground anchor at each corner of the building. The total resisting force of the anchors shall be equal to 20 psf times the plan area of the building.

SECTION R317
PROTECTION OF WOOD AND WOOD BASED PRODUCTS AGAINST DECAY

R317.1 Location required. Protection of wood and wood based products from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1.

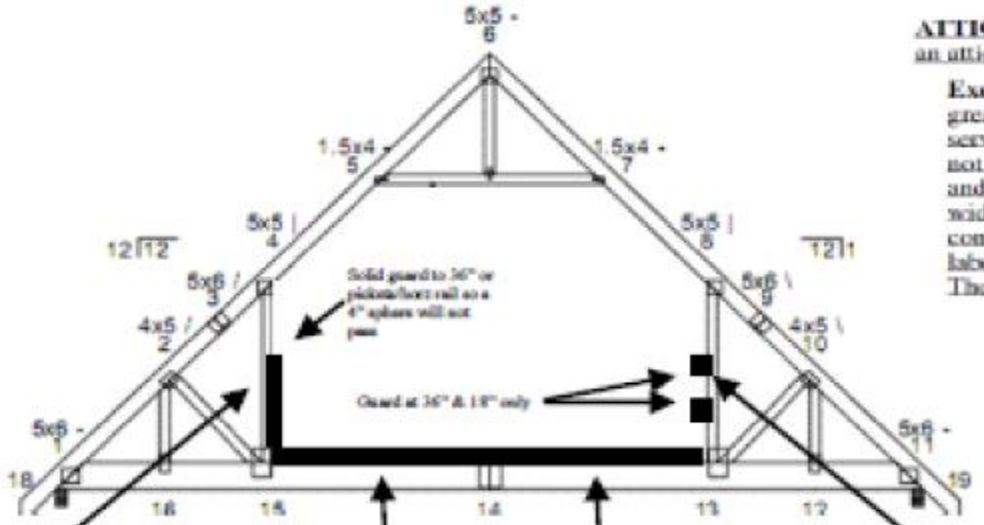
1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.
2. All exterior sills and plates that rest on concrete or masonry exterior foundation walls.
3. Sills and sleepers on a concrete or masonry slab, unless the slab that is in direct contact with the ground is separated from the ground by an *approved* impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than $^1/_2$ inch (12.7 mm) on tops, sides and ends.
5. Wood siding and sheathing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground.

We have been allowing cap blocks for leveling of accessory buildings in the past, but we have not set a height limitation on them. In order to keep it from getting out of hand, the max ht of these walls should be set at 18” so it coincides with the min ht for floor joists from grade. (R317.1, #1) Once it exceeds 18”, blocks cannot be dry-stacked.

What is required for Attic flooring? When are guardrails required in an attic? When should the attic be labeled "Not for Storage?"

ATTIC STORAGE. A floored area, regardless of size, within an attic space that is served by an attic access.

Exception: A floor walkway not less than 24 inches wide or greater than 48 inches wide that serves as an access for the service of utilities or equipment, and a level service space not less than 30 inches deep or greater than 48 inches deep and not less than 30 inches wide or greater than 48 inches wide at the front or service side of the appliance, shall not be considered as attic storage. Such floored area shall be labeled at the attic access opening, "NOT FOR STORAGE." The lettering shall be a minimum of 2 inches in height.



Access by fixed stair or walk out full size door guardrail required around floored area (see examples)

Access by scuttle hole, smurf door or pull down ladder (limited access for storage) can use guard at 36" and second horizontal guard at 18" (see examples)

Floored area

Note: if floor is over to rafter or truss top chord so that from edge of subfloor to underside of rafter/truss is 36" or less no guard required

Approved By Lon McSwain/Building Code Administrator Date 9/5/2012

My framer is being told that all the plywood seams under an HVAC platform in the attic need to be blocked. This is not a walk in attic. It has pulldown stairs as access.
>>
We have been blocking all the perimeter edges of the platform areas but not the interior seams of the plywood. He is using three-quarter inch CDX plywood , instead of tongue and groove. He is being told that all interior seams need to be blocked unless you use tongue and groove plywood. >> Can you clarify this for me?

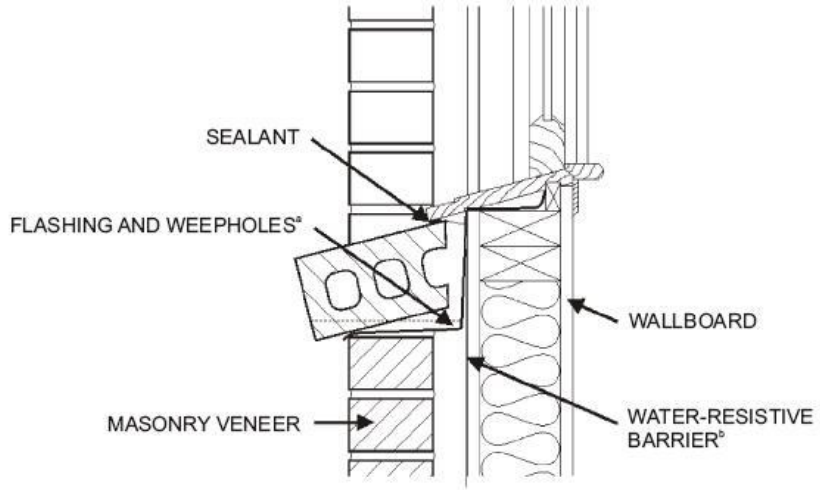
Technically that is correct as we look at those areas as floors. We would follow the span rating and attachment schedule indicated in the code unless you are t&g or we have allowed double layer of 7/16" with the layers crossing each other. We really have no other way to look at it than a floor and install it per floor sheathing.

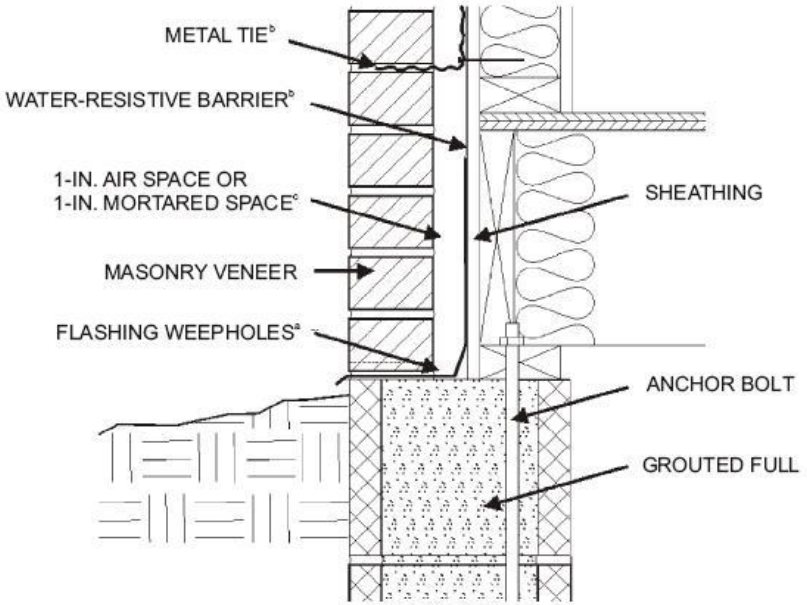
For years we used 1/2" OSB only in attics under the HVAC equipment until the HVAC guys starting requesting 3/4" plywood (or double 1/2" OSB). Since there are limited live load requirements for ceiling joist applications would those not apply here as well? Making this not a full live load floor application?

That’s a great question and the span of the plywood or osb is generally worse case scenario, the code doesn't address what you indicated. It addresses spans of ceiling joists with limited attic storage which is what you’re talking about but plywood or osb doesn't have different spans stamped on the product based on limited storage 20 psf live load, sleeping area 30psf live load or other areas at 40 psf live load. This was not a problem previously until they had a homeowner accident in Raleigh and the State ruled that this was a floor system which made everyone rethink not only guard protection but is that floor being installed like other floors in the home. I don't think you have any major issue using 3/4" without t&g however we would probably have to look to APA for some alternate guidance on their products rather than the code.

HVAC Platforms in Attic

Is flashing required on masonry window sills?





R703.8 Flashing. *Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Install flashing in accordance with ASTM E 2112 Standard Practice for Installation of Exterior Windows, Doors and Skylights, or the manufacturer's supplied written instructions. Aluminum flashing may not be used in contact with cementitious material, except at counter flashing. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage.

R302.11 Fireblocking. In combustible construction, fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top *story* and the roof space.

Fireblocking shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family *dwelling* is required at the line of *dwelling unit* separation.

Where handrails pass by a tread nosing, must we maintain 1 ½” clearance between nosing and handrail?

R311.7.7.2 Continuity. Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1½ inch (38 mm) between the wall and the handrails.

Exceptions:

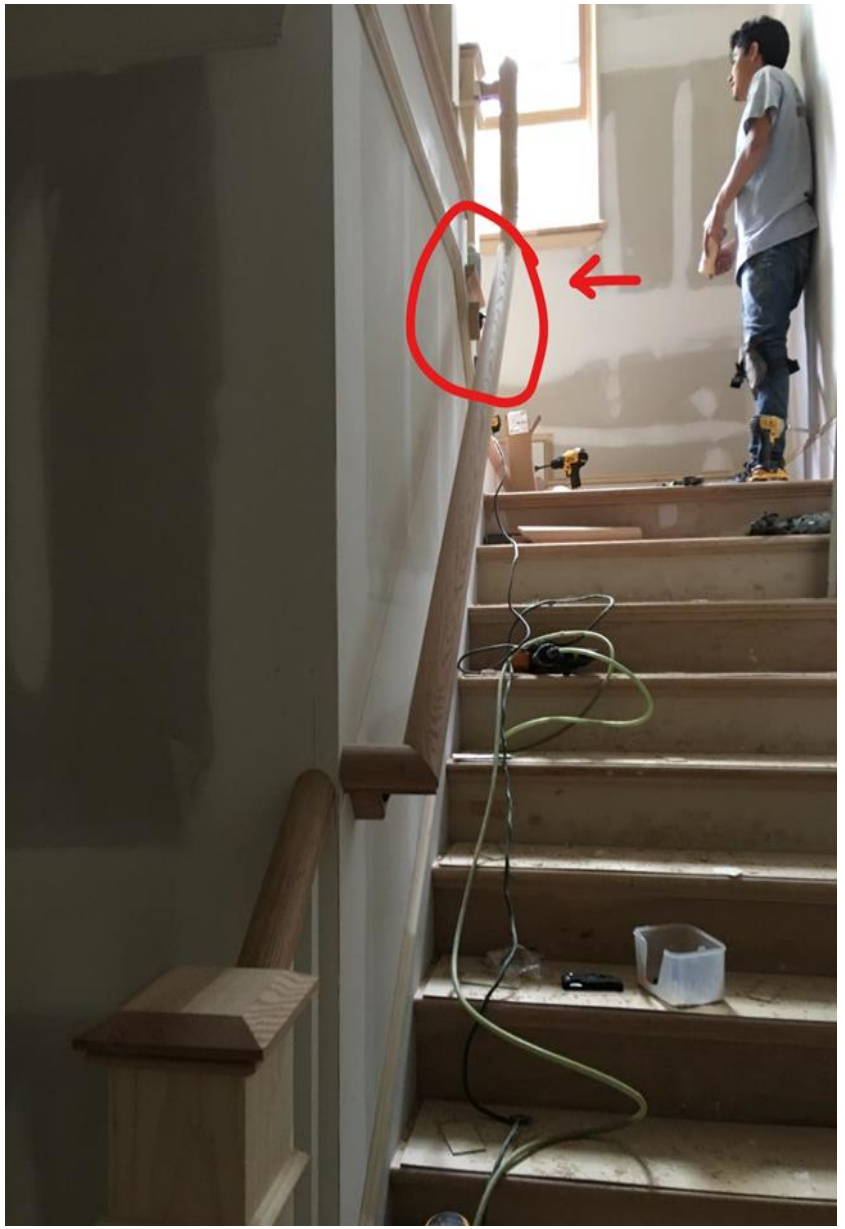
1. Handrails shall be permitted to be interrupted by a newel post.
2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.
3. Two or more separate rails shall be considered continuous if the termination of the rails occurs within 6 inches (152 mm) of each other. If transitioning between a wall-mounted handrail and a guardrail/handrail, the wall-mounted rail must return into the wall.

Discussion: There is no direct requirement for this in the NC Residential Code, however the intent of the 1½" distance requirement is to allow the user's knuckles to clear any rough surfaces or obstructions on the wall. Also, as the commentary states it, *This distance … will provide an adequate distance so that the handrail may be quickly grabbed as an assist in the arrest of a fall*.

As you have noted, the NC Residential Code allows for an interruption of the handrail for as much as 6". (R311.7.7.2, exception #3) I believe the intent of this exception is to allow a break in the rails that occurs over a tread so that someone could stand on the stair and reach for the other rail before descending to the next step however, this is not specifically mentioned in the code text.

Conclusion: The NC Residential Code section R311.7.7.2 only addresses the distance from an adjacent **wall** to a handrail. While a "best practice" might be to maintain that distance from any other element such as a stair nosing, the code does not directly address the distance from the handrail to any other element. Since there seems to be some distance between the handrail and the stair nosing in the attached pictures, and since the NC Residential Code would allow an interruption of the handrail for as much as 6", the installation in the attached pictures cannot be said to be a direct code violation although it may not meet the implied intent of this code section.

It should be said that a continuous handrail on the opposite wall would be another way to resolve this issue.



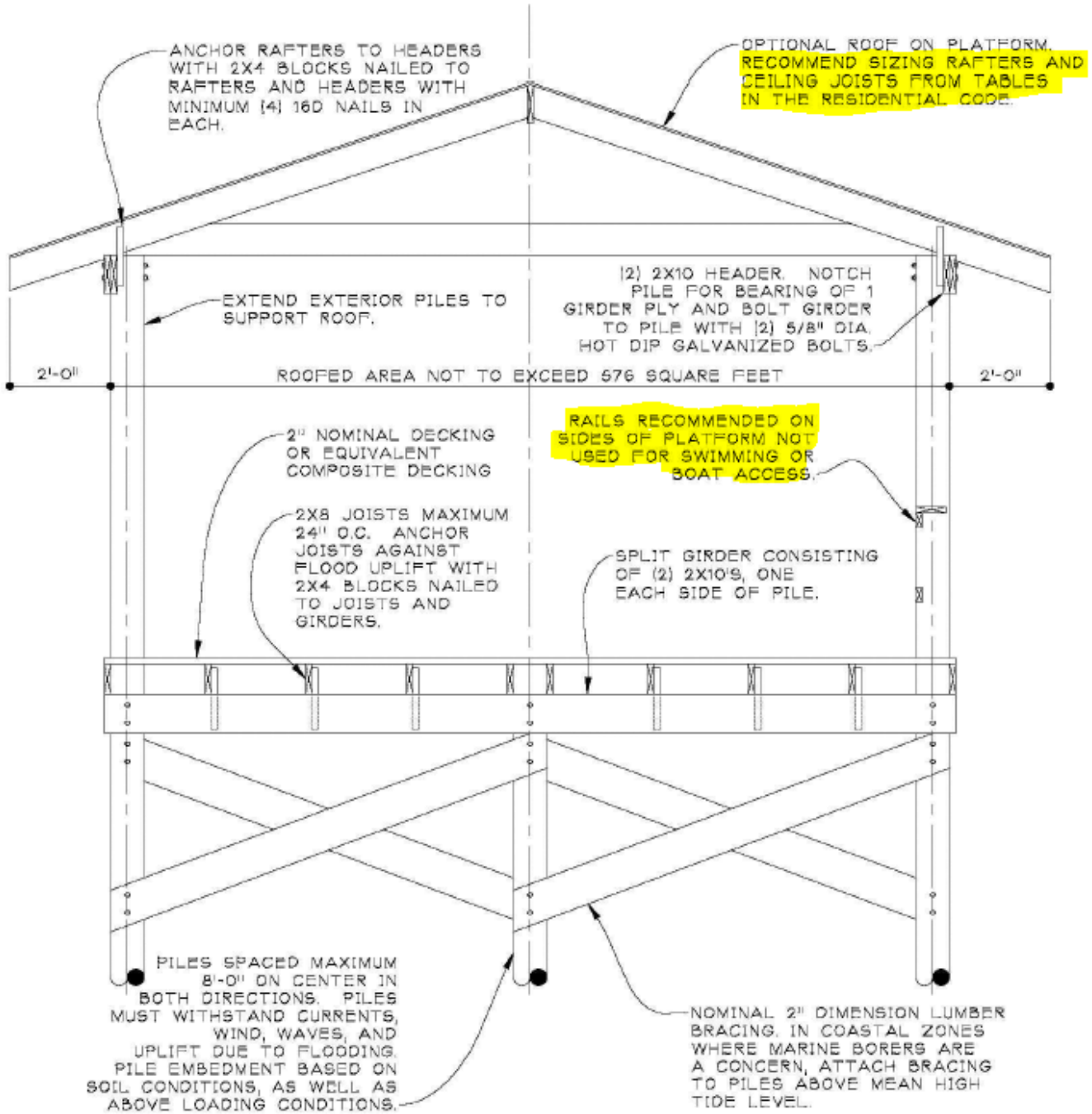
What are the code requirements for guardrails on walkways, stairs & upper level decks on piers?

Guardrail must meet …

Guardrails over water must meet …

Stairs and handrails must meet …

What are the code requirements for guardrails on walkways, stairs & upper level decks on piers?



Questions from the floor


Break

Training Topic:

~~Sales Offices & Model Homes~~